

CLAIMS

1. An evaporator comprising a refrigerant inlet header and a refrigerant outlet header arranged side by side in a front-rear direction, and a refrigerant circulating passage for holding the two headers in communication with each other therethrough, the inlet header having a refrigerant inlet at one end thereof, the outlet header having a refrigerant outlet at one end thereof alongside the inlet end, a refrigerant being permitted to flow from the refrigerant inlet into the inlet header and to return to the outlet header through the circulating passage so as to be sent out from the refrigerant outlet,

the inlet header and the outlet header being closed with respective caps each at said one end thereof, the refrigerant inlet being formed in the cap of the inlet header, the refrigerant outlet being formed in the cap of the outlet header, a platelike pipe joint member having a refrigerant inlet portion in communication with the refrigerant inlet and a refrigerant outlet portion in communication with the refrigerant outlet and being joined to both the caps of the inlet header and the outlet header.

2. An evaporator according to claim 1 wherein the refrigerant inlet portion and the refrigerant outlet portion of the pipe joint member are each in the form of a short tube, a refrigerant inlet pipe having a constricted end portion inserted in and joined to the refrigerant inlet portion, a refrigerant outlet pipe having an end portion inserted in and joined to the refrigerant outlet portion.

3. An evaporator according to claim 2 wherein the refrigerant inlet portion is smaller than the refrigerant outlet portion in outside diameter.

4. An evaporator according to claim 2 wherein the
5 refrigerant outlet pipe is provided at said end portion with a constricted portion inserted in and joined to the refrigerant outlet portion.

5. An evaporator according to claim 1 wherein one of the cap and the pipe joint member is provided with a positioning
10 lug projecting toward the other, and the other is provided with a positioning recess for the lug to fit in.

6. An evaporator according to claim 1 wherein the caps are in the form of an integral piece.

7. An evaporator according to claim 1 wherein the inlet
15 header and the outlet header comprise a first member forming portions of the two headers adjacent to the circulating passage and a second member forming the remaining portions of the two headers and brazed to the first member, whereby the two headers are made integral with each other, each of the caps having
20 engaging lugs engageable with the first member and the second member respectively.

8. An evaporator comprising a heat exchange core composed of tube groups in the form of a plurality of rows arranged in a front-rear direction, each of the tube groups comprising
25 a plurality of heat exchange tubes arranged at a spacing in a left-right direction, a refrigerant inlet header positioned toward one end of each heat exchange tube and having joined thereto the heat exchange tubes of the tube group of at least

one row, a refrigerant outlet header disposed toward said one end of each heat exchange tube and positioned forwardly or rearwardly of the inlet header, the outlet header having joined thereto the heat exchange tubes of the tube group of at least one row, a refrigerant inflow header positioned toward the other end of each heat exchange tube and having joined thereto the heat exchange tubes joined to the inlet header, and a refrigerant outflow header positioned toward said other end of each heat exchange tube and having joined thereto the heat exchange tubes joined to the outlet header, the inflow header and the outflow header being in communication with each other to provide a refrigerant turn portion, the inlet header and the outlet header being closed with respective caps each at one end thereof, the cap of the inlet header having a refrigerant inlet, the cap of the outlet header having a refrigerant outlet, a platelike pipe joint member having a refrigerant inlet portion in communication with the refrigerant inlet and a refrigerant outlet portion in communication with the refrigerant outlet and being joined to both the caps of the inlet header and the outlet header.

9. An evaporator according to claim 8 wherein the refrigerant inlet portion and the refrigerant outlet portion of the pipe joint member are each in the form of a short tube, a refrigerant inlet pipe having a constricted end portion inserted in and joined to the refrigerant inlet portion, a refrigerant outlet pipe having an end portion inserted in and joined to the refrigerant outlet portion.

10. An evaporator according to claim 9 wherein the

refrigerant inlet portion is smaller than the refrigerant outlet portion in outside diameter.

11. An evaporator according to claim 9 wherein the refrigerant outlet pipe is provided at said end portion with
5 a constricted portion inserted in and joined to the refrigerant outlet portion.

12. An evaporator according to claim 8 wherein one of the cap and the pipe joint member is provided with a positioning lug projecting toward the other, and the other is provided
10 with a positioning recess for the lug to fit in.

13. An evaporator according to claim 8 wherein the pipe joint member is provided with a positioning lug projecting toward the cap, and the cap is provided with a positioning recess for the lug to fit in, the inlet header and the outlet
15 header being closed with respective blind caps each at the other end thereof, the blind caps not having the positioning recess formed in the cap.

14. An evaporator according to claim 13 wherein the inlet header and the outlet header comprise a first member having
20 the heat exchange tubes joined thereto, and a second member joined to the first member at a portion thereof opposite to the heat exchange tubes, whereby the inlet and outlet headers are made integral with each other, each of the caps and the blind caps having engaging lugs engageable with the first member
25 and the second member respectively.

15. An evaporator according to claim 14 wherein the inlet header and the outlet header are provided by dividing interior of a single refrigerant inlet-outlet tank into a front and

a rear portion by partitioning means.

16. An evaporator according to claim 15 wherein interior of the outlet header is divided by separating means into first and second two spaces arranged in the direction of height, and the heat exchange tubes joined to the outlet header extend into the first space, the second space of the outlet header being in communication with the refrigerant outlet.

17. An evaporator according to claim 16 wherein the partitioning means and the separating means are integral with the second member.

18. An evaporator according to claim 16 wherein the caps, as well as the blind caps, are made integral with each other, and the caps, as well as the blind caps, have a first protrusion fitting in the inlet header, a second protrusion fitting in the first space of the outlet header and a third protrusion fitting in the second space of the outlet header, the first protrusion of the caps being provided with the refrigerant inlet, the third protrusion of the caps being provided with the refrigerant outlet.

19. A process for fabricating an evaporator according to claim 2, the process being characterized by forming a refrigerant inlet header and a refrigerant outlet header arranged side by side in a front-rear direction, and a refrigerant circulating passage for holding the two headers in communication with each other therethrough, joining a cap having a refrigerant inlet to one end of the inlet header and a cap having a refrigerant outlet to one end of the outlet header, joining a plate like pipe joint member having a refrigerant inlet portion in the

form of a short tube and to be in communication with the inlet and a refrigerant outlet portion in the form of a short tube and to be in communication with the outlet to both the caps of the inlet header and the outlet header, thereafter inserting
5 a constricted end portion of a refrigerant inlet pipe into the inlet portion of the pipe joint member and an end portion of a refrigerant outlet pipe into the outlet portion of the pipe joint member, and brazing the inlet portion and the outlet portion of the pipe joint member to the inlet pipe and the
10 outlet pipe respectively at the same time using a high-frequency heating coil in the form of a spectacle-shaped assembly of two annular portions, with one of the annular portions positioned around the inlet portion of the pipe joint member and the other annular portion positioned around the outlet portion thereof.

15 20. A process for fabricating an evaporator according to claim 9, the process being characterized by making a heat exchange core composed of tube groups in the form of a plurality of rows arranged in a front-rear direction, each of the tube groups comprising a plurality of heat exchange tubes arranged
20 at a spacing in a left-right direction, a refrigerant inlet header positioned toward one end of each heat exchange tube and having joined thereto the heat exchange tubes of the tube group of at least one row, a refrigerant outlet header disposed toward said one end of each heat exchange tube and positioned
25 forwardly or rearwardly of the inlet header, the outlet header having joined thereto the heat exchange tubes of the tube group of at least one row, a refrigerant inflow header positioned toward the other end of each heat exchange tube and having

joined thereto the heat exchange tubes joined to the inlet header, and a refrigerant outflow header positioned toward said other end of each heat exchange tube and having joined thereto the heat exchange tubes joined to the outlet header
5 by collectively brazing the components, conducting a brazing operation simultaneously with the collective brazing step to braze a cap having a refrigerant inlet to one end of the inlet header and a cap having a refrigerant outlet to one end of the outlet header, to braze blind caps respectively to the
10 other ends of the inlet header and the outlet header, and to braze a pipe joint member having a refrigerant inlet portion in the form of a short tube and to be in communication with the inlet and a refrigerant outlet portion in the form of a short tube and to be in communication with the outlet to both
15 the caps of the inlet header and the outlet header, thereafter inserting a constricted end portion of a refrigerant inlet pipe into the inlet portion of the pipe joint member and an end portion of a refrigerant outlet pipe into the outlet portion of the pipe joint member, and brazing the inlet portion and
20 the outlet portion of the pipe joint member to the inlet pipe and the outlet pipe respectively at the same time using a high-frequency heating coil in the form of a spectacle-shaped assembly of two annular portions, with one of the annular portions positioned around the inlet portion of the pipe joint member
25 and the other annular portion positioned around the outlet portion thereof.

21. A refrigeration cycle comprising a compressor, a condenser and an evaporator, the evaporator comprising an

evaporator according to any one of claims 1 to 18.

22. A vehicle having installed therein a refrigeration cycle according to claim 21 as a motor vehicle air conditioner.